

SYSTEM FOR ARRANGING INTERACTIVE GAMES BETWEEN  
PLAYERS VIA MULTIMODE COMMUNICATION DEVICES

BACKGROUND OF THE INVENTION

5           The present invention is directed to assembling multimode  
communication device users, such as wireless telephone users, together for  
the purpose of playing interactive games using the multimode communication  
device for game input and game output, and more particularly for sending  
game invitations between wireless telephone users to allow the users to join  
10   an interactive wireless telephone game and for allowing the game to be  
suspended when one of the players in the game accepts a voice telephone call.

          Many wireless telephones, such as a Mitsubishi T250 (CDPD)  
telephone subscribing to the AT&T PocketNet service and several Sprint PCS  
(CDMA- Code Division Multiple Access) telephones subscribing to the  
15   Sprint Wireless Web (HDML - Handheld Device Mark-up Language)  
telephone service, include microbrowsers that enable users of the telephones  
to access the Internet using a language such as WML (Wireless Mark-up  
Language). These microbrowsers, provided by companies such as  
Phone.com, typically communicate with a gateway computer. The gateway

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telephones must switch between voice and data. While in the data mode, such as when using the microbrowser to access the Internet, these telephones cannot make or receive voice calls. To solve this problem, Internet call waiting products of the type described in copending U.S. application serial  
5 number 09/614,717 filed July 12, 2000 by Safi et al., entitled "System for Providing Internet Call Waiting For Digital Cellular Telephones," give the mobile client the option of taking a voice call. However, such products do not address the problems which occur when one of the participants in a game being played between mobile clients receives a call.

10 If one of the participants in the game receives a call while a game is being played between at least two mobile clients, other players must wait until the call is over for the mobile client to make his move. Currently, mobile game providers do not inform other mobile client game players that a player has taken a call. Thus, there is a need in the art to provide a system  
15 which is capable of informing other players when a called player becomes engaged in a telephone call, so that the other players can make decisions about the game, such as removing the player from the game or waiting for the player to reenter the game.

#### SUMMARY OF THE INVENTION

20 In one aspect, the present invention seeks to overcome the disadvantages of the prior art described above by providing an improved method for sending an invitation inviting another mobile client to engage in a competitive activity such as a game via wireless telephones.

In another aspect, the present invention also seeks to provide the capability for mobile clients to accept such invitations to join an existing competitive activity, such as a wireless telephone game.

5 In another aspect, the present invention also seeks to provide a mobile client with the ability to block an invitation to engage in a competitive activity so that only invitations from a selected list of potential competitors are received.

10 In another aspect, the present invention also seeks to provide the capability of informing competitors engaged in a competitive activity if one of the other competitors takes a voice telephone call, effectively leaving the competitive activity.

15 One feature of the present invention relates to the formation of competitive activities between a first competitor having a first multimode communication device, and other competitors. The first competitor is provided with a predetermined list of one or more potential competitors and selects at least one of the competitors from the list of potential competitors as a second competitor via the first multimode communication device. A competition is then formed between the first competitor and the selected second competitor via first and second multimode communication devices.

20 Another feature of the present invention relates to notification to a first competitor who receives a voice telephone call and notification of other competitors when the first competitor accepts the call. If a first multimode communication device is in a competitive activity mode when a voice telephone call to a user of the first multimode communication device is attempted, the user of the first multimode communication device is informed of the voice call. If the user of the first multimode communication device accepts the voice telephone call, the user of the second multimode communication device is notified.

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These together with other features and advantages which will be subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 depicts the components of the present invention.

Figure 2 is a diagram showing the flow of information between components when joining mobile clients together in a game in accordance with the present invention.

Figure 3 is a flow chart which depicts the process of joining mobile clients together in a game in accordance with the present invention.

Figure 4 is a diagram depicting the flow of information between components when a player accepts a voice telephone call during a game in accordance with the present invention.

Figure 5 is a flow chart illustrating the process which occurs when a player accepts a telephone call during a game in accordance with the present invention.

Figure 6 illustrates sample mobile client cards (i.e., formatted information screens), which are generated in accordance with the present invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described generally above, the present invention is directed to improvements in arranging and conducting competitive activities between competitors via multimode communication devices. In the detailed description provided below, the multimode communication devices are described as wireless telephones. However, the present invention is not limited to wireless telephones but could also be applicable to multimode communications devices, including, but not limited to, PC and cable devices. In addition, the features of the invention are directed to any competitive activity. While the description provided below provides the example of a game, the features in the present invention are not limited to games but are also applicable to other types of competitive or sequential participation activities, such as round-robin activities, turn-taking activities, etc. Examples of competitive activities to which the features of the present invention may be applied, include parlor games such as hearts, bridge and checkers; gambling games such as black jack and poker; competitions relating to fantasy sports leagues such as fantasy sports drafts and trading; auctions; and debates. In general, the features of the present invention can be applied to any type of competitive or sequential participation event.

Referring to Fig 1, a physical host 20, such as a PC running Windows, or a Sun Work Station running Unix, contains both a WAP (Wireless Application Protocol) server 22 and a session server 24. As is well known in the art, there are a number of ways to host servers on the physical host 20. For example, the WAP server 22 could run on a separate host from the session server 24. In addition, if there is a heavy mobile client load, there may be multiple WAP servers 22 or session servers 24. In addition, the various servers could all be on the same machine or on separate machines depending on the load.

The WAP server 22 is used to send information to a WAP gateway 26 that is then forwarded to a mobile client. In response to a request (URL) from the mobile client, the web server will respond via the Internet with static and dynamically generated formatted information. This information is formatted using the wireless mark-up language (WML) and the formatted page of information which is displayed to a user is referred to as a card. While the invention is described using WAP and WML protocols, other protocols could be used in connection with the features of the present invention. In particular, any protocol that supports transmission and presentation of data over mobile lines and the presentation on mobile handsets can be used. An example of an alternative protocol is i-mode, a packet based communication protocol based on cHTML (compact hypertext markup language). The i-mode service is offered by NTT DoCoMo, a Japanese telecommunications company.

In operation, the WAP gateway 26 forwards WAP requests (URLs) received from a mobile client, (for example, a mobile client 28) to the WAP server 22. The WAP server 22 sends response information to the WAP gateway 26 which in turn forwards the information to the mobile client 28. In particular, the URL request goes to a cell tower through the wireless network to the WAP gateway 26 which forwards the URL request to the session server 24. Ultimately, the session server 24 obtains a response and sends it back on the reverse path to the WAP gateway 26 over the cell tower out to the mobile client. The mobile client 28, which could be, for example, a wireless telephone, is loaded with an appropriate browser (e.g., a WAP browser) which displays a response card or page.

The WAP server 22 requests information from the session server 24 to generate reformatted response cards. The session server 24 is used to manage games being formed, retrieving and modifying friend lists, sending invitations to friends, tracking whether mobile clients are accepting

invitations, and retrieving pending messages for display. The session server  
 24 manages these tasks by storing game and player information in a database  
 30 which is used to store game information, friend information, availability  
 for invitations, pending invitations, and pending messages. The physical host  
 5 20 (which includes the session server 24 and the WAP server 22) and the  
 database 30 together form a competition control unit 31. Each mobile client  
 can set whether they want to receive all invitations, no invitations, or  
 invitations only from friends. These settings are stored in the database 30.  
 Each of the mobile clients can adjust their position regarding the acceptance  
 10 of invitations by going to a web page and causing a change in their invitation  
 acceptance list within the database 30. Alternatively, each of the mobile  
 clients can also adjust their position regarding the acceptance of invitations  
 through WAP requests. As described above, although the features of the  
 invention are described below primarily in terms of the use of the invention  
 15 to form and conduct games, in fact, the features of the present invention are  
 applicable to any competitive, sequential participation, turn-taking or round-  
 robin activities. Further, the features of the invention can be applied to any  
 WAP system, apparatus or device that has connectivity, whether wireless or  
 wire-based, to a network operator in situations where there is only one type of  
 20 communication over a channel at any one time.

The process of joining mobile clients together, for example,  
 mobile client 28 and mobile client 32, in a game begins when one mobile  
 client, for example, client 28, makes a request to begin a game. This request  
 is received by the WAP server 22 which asks the session server 24 to add to  
 25 the database 30 a new game table record representing the game being formed.  
 This game table is given a unique ID. The WAP server 22 then forms a  
 response card such as response card or page 602 in Figure 6. This advises  
 mobile client 28 that the WAP server 24 is waiting for one player and invites  
 mobile client 28 to invite a friend. This allows mobile client 28 to make a



request to invite other players to the game. The WAP server 40 then requests a list of friends stored in the database 30 for mobile client 28.

This list defines a community of game players or competitors, and can be similar to a so-called buddy list which is used by PC users for instant messaging purposes. The list is a predetermined list in the sense that each of the competitors who use the system is entitled to specify in advance a list of friends, or a list of groups of friends (i.e., teams) with which they are willing to compete. Therefore, in accordance with the present invention, team lists may be created for use in group competitions.

The availability of each of the friends identified in the friends list is determined by way of a presence manager 33 which is capable of determining whether the wireless telephone for each of the friends identified on the friends list is turned on and therefore accessible. Thus, the presence manager 33 keeps track of whether a mobile client or a mobile phone is on, and in range. The presence manager 33 can take the form of any one of a number of available products, such as the IM-Anywhere™ server manufactured by Invertix of Annandale, Virginia. Another example of a presence server which can act as the presence manager 33 is described in copending U.S. application serial number 09/698,047 filed October 30, 2000 by Braudes, entitled "System For Modifying Telephone Network Call Routing Based On Presence Information," the contents of which is hereby incorporated by reference.

The WAP server 22 formats the information from the database 30 and sends the list of friends and their availability to receive invitations back to mobile client 28 in the form illustrated by card 604 in Figure 6. Card 604 provides a list of friends and indicates that one of the friends is not accepting invitations. Mobile client 28 can use the card to select one or more friends to invite to the game. The WAP server 22 then requests the session server 24 to send an invitation to the selected friend. For example, mobile

client 32. The WAP server 22 passes the ID for mobile client 28 and the invited friends' ID (i.e., mobile client 32) as part of the request. The session server 24 sends the invitation to mobile client 32 (i.e., the wireless telephone of mobile client 32).

5                   The form of the invitation depends on the capabilities of the wireless network and the WAP gateway 26. One way of sending the invitation is by using the Phone.com alert method. To use this alert, the session server 24 sends the ID for mobile client 32 and a URL to the WAP gateway 26. The WAP gateway 26 pushes the alert to the mobile client 22  
10                   wireless telephone. The alert appears on the wireless telephone, giving the mobile client 32 the option of viewing the associated URL. The mobile client 32 then makes the URL request to the WAP server 22 which in turn forms an invitation card such as the card 606 in Figure 6, which invites mobile client 32 to play a game. Then, using the card, mobile client 32 is allowed to accept  
15                   or decline the invitation. If the invitation is accepted, the WAP server 22 receives this acceptance and makes a request to the session server 24 to add mobile client 32 to the active game table stored in database 30. As a result, mobile clients 28 and 32 are joined together in a game. If desired, mobile client 28 may also ask additional players to join the game.

20                   Another aspect of the present invention provides for managing the game when one of the players leaves the game (temporarily or permanently) to take a telephone call, will now be described with reference to Figure 1. Figure 1 illustrates an Internet Call Waiting (ICW) server 34 which is connected to the public switched telephone network (PSTN) 36. The ICW  
25                   server 34 has to notify the session server 24, so that the session server 24 can notify all of the other game players when a called person takes a call. If a mobile client is in a data mode and receives a voice call, the voice call will not go through, without the ICW server 34 or some similar type of product. If the ICW server 34 is not available, the caller will get a busy signal and the

call will go to voice mail. The competition control unit 31, ICW server 34 and presence manager 33 are connected via a network connection 33 to form a local area network (LAN), preferably using an Ethernet. It should be noted that the presence manager 33, ICW server 34, host 20 and database 30 may be located at one location or may be distributed over several locations. For example, these elements can be run as a platform at the site of a wireless service provider or they can be operated remotely via connection to the Internet. The ICW server 34 is described in detail in copending U.S. application serial number 09/614,717, filed July 12, 2000 by Safi et al., entitled "System For Providing Internet Call Waiting For Digital Cellular Telephones," the contents which are hereby incorporated by reference. The competition control unit 31, the ICW server 34, the presence manager 33, the WAP gateway 26 and the wireless network together form a wireless communication system. The ICW server 34 receives a transferred call from a busy data enable device (DED), such as a wireless telephone operating in a data mode, and sends a wireless Internet call waiting (ICW) notification to the wireless telephone via the WAP gateway 26. DEDs are devices which have the capability to communicate with a network through a data channel. While an example of a DED is a cellular telephone that contains a WAP/HDML compliant lightweight browser, a DED is not limited to a cellular telephone and could be any DED that is capable of sending/receiving a call over a voice channel. A DED is able to operate over one or more of several different types of networks (CDPD, GSM, GPRS, W-CDMA, Edge broadband interface, UMTS, CDMA 2000, etc.).

In accordance with the present invention, if a mobile client such as mobile client 28, is playing a game (in the data mode), the ICW server 34 will send an ICW notification to the wireless phone of mobile client 28. If mobile client 28 chooses not to accept the call, they will be returned to the game and game play is considered uninterrupted. If mobile client 28

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client 28 has returned from the telephone call and is able to play.

Alternatively, if the database 30 indicates that the status of the mobile client game session is "replaced" or "drop" then mobile client 28 will not be allowed to rejoin the game but may begin a new game or join another game if one is available.

The process of inviting players to form a game in accordance with the present invention is described in detail below with reference to Figures 2 and 3 of the drawings. A mobile client 28 makes a request to start a game at 40 and a start game card is produced at mobile client 28. As a result, the request passes the mobile client ID for mobile client 28 to the session server 24 which forms a game at 42. The session server 24 accesses database 30 and places the mobile client ID for mobile client 28 in a new game in the active games portion of the database 30. The session server 24 then formats a card such as card 602 in Figure 6 and sends the card to the mobile client 28 to see if mobile client 28 wants to invite a friend. This process is referenced in Figure 3 as return waiting for players dialog at 44.

The mobile client 28 can then make a request to send a list of friends 46 at which time the mobile client ID for mobile client 28 is provided to the session server 24 which accesses the friends portion of the database 30 to retrieve the predetermined list of friends (48 in Figure 3) corresponding to mobile client 28 and to determine which friends are accepting invitations. Thus, friends are provided with the option of accepting all invitations, accepting invitations from friends only, accepting no invitations, or specifically rejecting invitations from certain individuals. The session server 24 also contacts the presence manager 33 to determine which mobile client friends are accessible (50 in Figure 3) or contactable (i.e., their mobile phone is on). Friends who are not accepting invitations or who are not contactable are indicated as such on the friends list. The list of friends is formatted into a card such as card 604 in Figure 6, and provided to mobile client 28 at 52.

Mobile client 28 is able to select one or more friends to invite to play the game at 54. After one friend has been selected, mobile client 28 may be presented with card 602 again, to allow mobile client 28 to select another player. Mobile client 28 selects a friend who is to receive an invitation, and the mobile client ID of mobile client 28 and the mobile client ID of the invited person (e.g., mobile client 32) are sent to the session server 24. In addition, the invited person (e.g., mobile client 32) is provided with a card 612 after joining the game, when there are still not enough players to play the game.

Next the invitation is stored and the friend (e.g., mobile client 32) is alerted at 56. Specifically, the session manager 24 records the invitation in the pending invitations portion of database 30 and the session manager 24 sends an alert to the WAP gateway 26. The alert contains a URL request that the mobile client 32 can use to view the invitation at 58. The mobile client 32 can choose not to view the invitation in which case mobile client 32 does not join the game. Alternatively, mobile client 28 may also be advised that mobile client 32 has declined to view the invitation.

Alternatively, mobile client 32 can choose to view the invitation at 58 and a URL request is made to the session server 24 which receives the request and queries the pending invitation portion of the database 30 for a pending invitation for mobile client 32. The session server 24 formats the information into a card such as card 606 in Figure 6 and sends the card to the mobile client 32. It is next determined whether the mobile client 32 accepts the invitation at 62. If the mobile client 32 does not accept the invitation, then mobile client 28 is informed that the invitation has been declined at 64.

Alternatively, if the mobile client 32 accepts the invitation then mobile client 32 is joined in the game at 66. Specifically, the mobile client ID for mobile client 32 and the game ID are sent to the session server 24 which records the

mobile ID as being in the given game ID in the active games portion of the database 30.

The feature of the present invention wherein one of the players in an active game is notified of an incoming voice telephone call, and  
 5 wherein the game is managed so that other players are notified when one of the players has left to accept a voice telephone call, is described in detail below with reference to Figures 4 and 5 of the drawings.

Initially, a transferred call for mobile client 28 is received at 68. Specifically, the ICW server 34 receives a transferred call for a busy data  
 10 enabled device (DED) such as the wireless telephone of mobile client 28 which is operating in the data mode (e.g., playing a game), and sends a wireless Internet call waiting (ICW) notification to the telephone of mobile client 28 via the WAP gateway 26 at 70. Based on the notification, mobile client 28 can then elect to view the notification or not view the notification at  
 15 72. If mobile client 28 elects not to view the notification then the process ends. If mobile client 28 elects to view the notification at 72 then a request is sent to the ICW server 34 which responds by providing a call option card at 74.

Mobile client 28 then decides whether or not to take the call at 76. If the mobile client 28 decides not to take the call then the process ends. If mobile client 28 decides to take the call then a request is sent to the ICW server 34 which in turn sends a notification to the session sever 24 that the mobile client 28 is taking the call. In addition, the mobile client ID for mobile client 28 is also sent to the session server 24 at 78. The session server  
 20 24 then determines whether mobile client 28 is currently in a game at 80. Specifically, session server 24 queries the active games portion of the database 30 to determine if mobile client 28 is a player in a game. If the mobile client 28 is participating in a game, then a disposition of the game in progress is determined at 82. Specifically, the session server 24 retrieves the



mobile client IDs of the other players in the game and posts messages that a player has taken a call in the pending messages portion of the database 30 at 84. When another mobile client playing the game, such as mobile client 32, makes a request to the session server 24, the session server 24 checks the pending messages portion of the database 30 and formats the pending message for mobile client 32 into a card such as card 608 in Figure 6. This advises the other players that mobile client 28 has taken a telephone call at 86.

Pending notifications can be handled in a number of different ways. For example, the mobile client can have a refresh or polling operation every two to five seconds which acts as a request to trigger the transmission of any pending notification to the mobile client. Alternatively, when a pending message is created, it can be automatically sent to the players currently involved in the game using a push operation. Further, when a pending message is received, each player can at that time choose to "hold," "drop" etc. When mobile client 28 completes the telephone call, mobile client 28 may choose to return to a game session at 88 if the game session has a stored disposition of "hold" or "suspend." The mobile client 28 terminating the call sends the mobile client ID to the session server 24 which queries the active games portion of the database 30 to determine if mobile client 28 is a player in the game. The session server 24 retrieves the mobile client IDs of the other players of the game and informs the other players of the end of the call at 90 by posting messages that mobile client 28 has returned from the call in the pending messages portion of the database 30.

When another player, such as mobile client 22 is playing the game, and makes a request to the session server 24 to check for pending messages, the session server 24 checks the pending message portion of the database 30 for pending messages and the pending message is formatted into a card such as card 610 in Figure 6 which is send to the mobile client 32 to

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